

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P905067

Luminaire Tested: DFN2DIP-4P4F0-050D070US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905067  
REPORT IS A COMBINATION OF REPORTS P900651 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-050D070US835-FLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

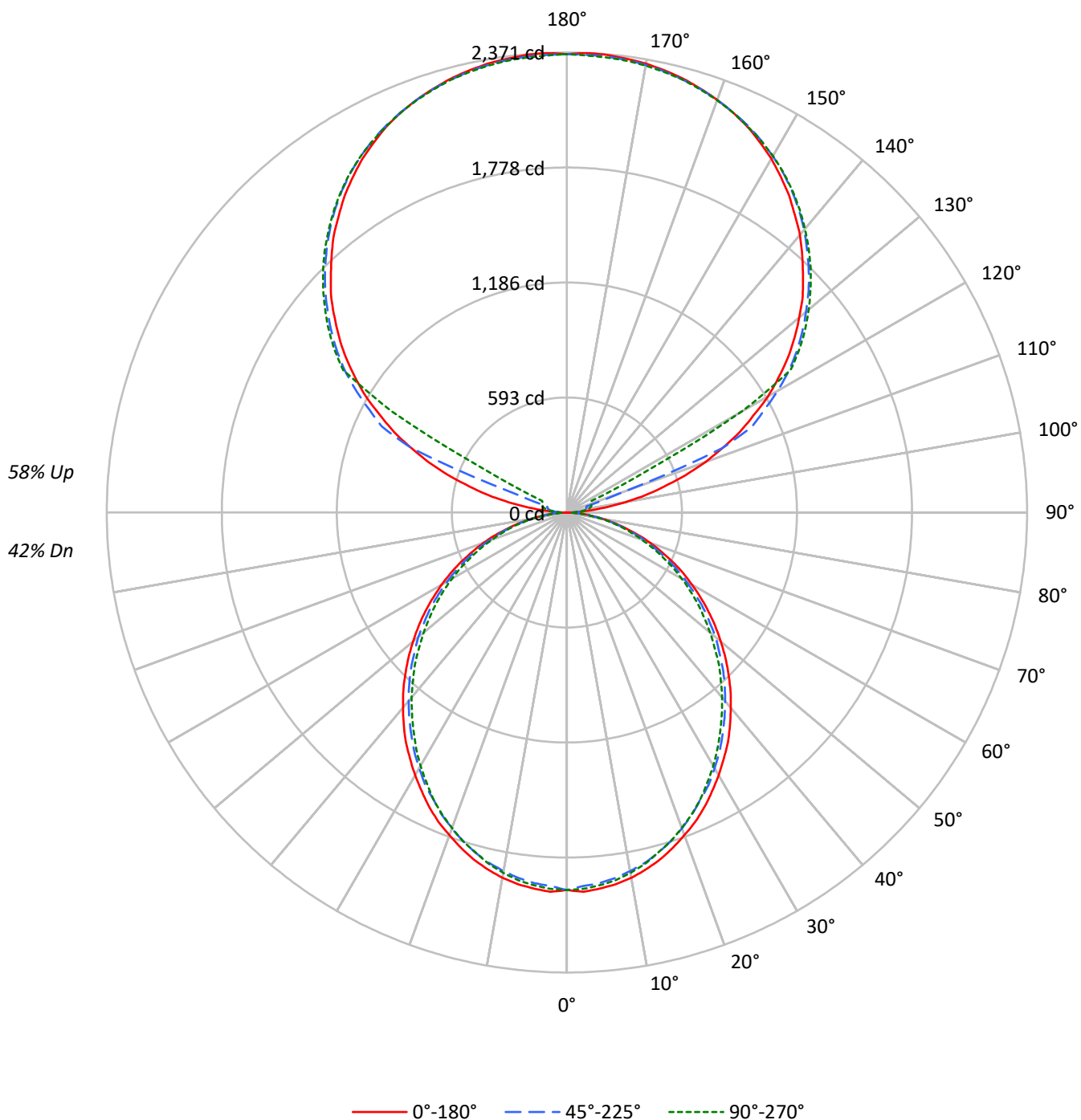
Lumens per Lamp: N/A  
Luminaire Lumens: 11880.0 lumens  
Efficiency: N/A  
Efficacy: 106.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 111.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



TEST NUMBER: P905067

CATALOG NUMBER: DFN2DIP-4P4F0-050D070US835-FLONL

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 63 | 63 | 63 | 49 | 49 | 49 |
| 1   | 96  | 92  | 88  | 84  | 87 | 84 | 80 | 78 | 69 | 67 | 65 | 55 | 54 | 52 | 43 | 42 | 41 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 60 | 57 | 53 | 49 | 46 | 44 | 38 | 36 | 34 |
| 3   | 80  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 49 | 45 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 38 | 35 | 32 | 30 | 27 | 25 |
| 5   | 67  | 55  | 47  | 41  | 61 | 51 | 44 | 39 | 42 | 37 | 33 | 34 | 30 | 27 | 27 | 24 | 22 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 33 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 22 | 19 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 53  | 41  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 22 | 26 | 22 | 19 | 20 | 18 | 15 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 22 | 18 | 15 | 18 | 15 | 13 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1262 | 1262 | 1262 |
| 5°  | 1264 | 1245 | 1253 |
| 10° | 1254 | 1229 | 1237 |
| 15° | 1236 | 1209 | 1211 |
| 20° | 1211 | 1181 | 1184 |
| 25° | 1186 | 1148 | 1153 |
| 30° | 1155 | 1117 | 1114 |
| 35° | 1126 | 1081 | 1072 |
| 40° | 1090 | 1044 | 1032 |
| 45° | 1054 | 1007 | 992  |
| 50° | 1014 | 968  | 945  |
| 55° | 973  | 923  | 902  |
| 60° | 927  | 870  | 852  |
| 65° | 876  | 815  | 794  |
| 70° | 811  | 748  | 732  |
| 75° | 721  | 668  | 675  |
| 80° | 614  | 566  | 564  |
| 85° | 445  | 389  | 381  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1218 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 183.1   | 1.5       |
| 10°-20°   | 515.2   | 4.3       |
| 20°-30°   | 757.2   | 6.4       |
| 30°-40°   | 879.4   | 7.4       |
| 40°-50°   | 878.3   | 7.4       |
| 50°-60°   | 765.8   | 6.4       |
| 60°-70°   | 566.1   | 4.8       |
| 70°-80°   | 320.3   | 2.7       |
| 80°-90°   | 88.7    | 0.7       |
| 90°-100°  | 77.9    | 0.7       |
| 100°-110° | 290.4   | 2.4       |
| 110°-120° | 770.2   | 6.5       |
| 120°-130° | 1277.4  | 10.8      |
| 130°-140° | 1356.9  | 11.4      |
| 140°-150° | 1261.1  | 10.6      |
| 150°-160° | 1013.9  | 8.5       |
| 160°-170° | 653.3   | 5.5       |
| 170°-180° | 224.9   | 1.9       |
| 0°-30°    | 1455.5  | 12.3      |
| 0°-40°    | 2334.9  | 19.7      |
| 0°-60°    | 3979.0  | 33.5      |
| 0°-90°    | 4954.2  | 41.7      |
| 90°-120°  | 1138.5  | 9.6       |
| 90°-150°  | 5033.8  | 42.4      |
| 90°-180°  | 6926.0  | 58.3      |
| 0°-180°   | 11880.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1946 | 1946  | 1946 | 1946  | 1946 |      |
| 5°   | 1946 | 1938  | 1918 | 1932  | 1929 | 185  |
| 15°  | 1852 | 1841  | 1816 | 1824  | 1815 | 522  |
| 25°  | 1676 | 1661  | 1630 | 1633  | 1630 | 771  |
| 35°  | 1446 | 1428  | 1398 | 1386  | 1377 | 903  |
| 45°  | 1177 | 1164  | 1136 | 1115  | 1108 | 908  |
| 55°  | 891  | 879   | 857  | 834   | 825  | 796  |
| 65°  | 601  | 589   | 571  | 554   | 544  | 594  |
| 75°  | 314  | 311   | 301  | 290   | 294  | 335  |
| 85°  | 77   | 75    | 73   | 67    | 66   | 85   |
| 90°  | 2    | 20    | 34   | 43    | 46   | 11   |
| 95°  | 111  | 55    | 67   | 75    | 74   | 131  |
| 105° | 520  | 571   | 104  | 123   | 130  | 555  |
| 115° | 983  | 1012  | 1055 | 263   | 140  | 968  |
| 125° | 1390 | 1412  | 1444 | 1456  | 1462 | 1239 |
| 135° | 1720 | 1747  | 1762 | 1780  | 1776 | 1328 |
| 145° | 1995 | 1993  | 2022 | 2034  | 2026 | 1248 |
| 155° | 2197 | 2181  | 2202 | 2212  | 2198 | 1012 |
| 165° | 2314 | 2304  | 2309 | 2321  | 2309 | 654  |
| 175° | 2368 | 2356  | 2359 | 2371  | 2354 | 225  |
| 180° | 2362 | 2362  | 2362 | 2362  | 2362 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1945.5 | 1945.5 | 1945.5 | 1945.5 | 1945.5 |
| 2.5°   | 1956.8 | 1947.5 | 1926.9 | 1945.5 | 1942.0 |
| 5°     | 1945.5 | 1938.2 | 1917.5 | 1932.4 | 1928.9 |
| 7.5°   | 1932.4 | 1921.3 | 1900.7 | 1915.8 | 1912.0 |
| 10°    | 1912.0 | 1898.9 | 1876.5 | 1891.3 | 1885.8 |
| 12.5°  | 1883.8 | 1872.7 | 1850.3 | 1859.6 | 1855.8 |
| 15°    | 1852.0 | 1840.9 | 1816.5 | 1824.1 | 1814.7 |
| 17.5°  | 1812.7 | 1801.6 | 1777.2 | 1786.5 | 1777.2 |
| 20°    | 1769.7 | 1758.6 | 1732.4 | 1737.9 | 1730.6 |
| 22.5°  | 1726.8 | 1709.9 | 1685.5 | 1685.5 | 1681.7 |
| 25°    | 1676.2 | 1661.3 | 1629.5 | 1633.1 | 1629.5 |
| 27.5°  | 1620.0 | 1606.9 | 1582.7 | 1577.1 | 1567.8 |
| 30°    | 1564.0 | 1549.0 | 1521.0 | 1515.4 | 1507.9 |
| 32.5°  | 1504.1 | 1493.0 | 1463.0 | 1451.7 | 1444.2 |
| 35°    | 1446.1 | 1427.5 | 1397.5 | 1386.2 | 1376.9 |
| 37.5°  | 1380.6 | 1363.8 | 1333.8 | 1320.7 | 1311.4 |
| 40°    | 1313.4 | 1298.3 | 1268.3 | 1251.6 | 1244.1 |
| 42.5°  | 1247.9 | 1232.8 | 1203.0 | 1184.1 | 1173.0 |
| 45°    | 1176.8 | 1163.7 | 1135.5 | 1115.1 | 1107.5 |
| 47.5°  | 1107.5 | 1094.4 | 1064.5 | 1043.8 | 1032.7 |
| 50°    | 1034.5 | 1025.2 | 999.0  | 972.8  | 963.4  |
| 52.5°  | 963.4  | 950.3  | 926.1  | 905.5  | 892.4  |
| 55°    | 890.6  | 879.3  | 856.8  | 834.4  | 825.1  |
| 57.5°  | 817.5  | 808.2  | 783.8  | 761.4  | 753.8  |
| 60°    | 744.5  | 737.2  | 711.0  | 690.3  | 684.8  |
| 62.5°  | 673.5  | 660.4  | 641.7  | 623.0  | 615.5  |
| 65°    | 600.6  | 589.3  | 570.6  | 553.8  | 544.4  |
| 67.5°  | 525.8  | 516.3  | 499.6  | 486.5  | 478.9  |
| 70°    | 456.5  | 449.0  | 432.1  | 419.0  | 411.7  |
| 72.5°  | 385.5  | 377.9  | 368.6  | 355.5  | 349.9  |
| 75°    | 314.2  | 310.6  | 301.1  | 290.0  | 293.8  |
| 77.5°  | 250.7  | 243.1  | 239.4  | 233.8  | 228.3  |
| 80°    | 187.2  | 185.2  | 181.4  | 175.9  | 172.1  |
| 82.5°  | 127.2  | 127.2  | 125.4  | 117.9  | 117.9  |
| 85°    | 76.6   | 74.8   | 73.0   | 67.3   | 65.5   |
| 87.5°  | 33.7   | 30.0   | 26.2   | 20.6   | 18.7   |
| 90°    | 1.6    | 20.5   | 34.1   | 42.8   | 46.1   |
| 92.5°  | 42.8   | 35.9   | 41.0   | 44.5   | 46.1   |
| 95°    | 111.0  | 54.6   | 66.6   | 75.3   | 73.5   |
| 97.5°  | 199.9  | 59.9   | 87.1   | 92.4   | 94.0   |
| 100°   | 302.7  | 68.4   | 97.4   | 111.0  | 114.5  |
| 102.5° | 415.3  | 412.1  | 100.9  | 119.6  | 124.8  |
| 105°   | 519.7  | 571.0  | 104.3  | 123.0  | 129.9  |
| 107.5° | 641.0  | 683.7  | 107.8  | 126.5  | 133.4  |
| 110°   | 757.4  | 793.1  | 299.2  | 128.3  | 135.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 866.8  | 897.4  | 868.4  | 131.5  | 136.8  |
| 115°   | 982.9  | 1011.9 | 1054.7 | 263.3  | 140.3  |
| 117.5° | 1083.8 | 1117.9 | 1147.1 | 902.5  | 454.7  |
| 120°   | 1196.6 | 1222.2 | 1253.1 | 1273.6 | 1042.8 |
| 122.5° | 1292.2 | 1319.6 | 1354.0 | 1364.1 | 1365.9 |
| 125°   | 1389.7 | 1412.0 | 1444.5 | 1456.5 | 1461.5 |
| 127.5° | 1478.6 | 1502.5 | 1528.3 | 1545.4 | 1547.0 |
| 130°   | 1562.4 | 1589.8 | 1608.5 | 1627.4 | 1625.8 |
| 132.5° | 1647.9 | 1670.2 | 1688.9 | 1704.3 | 1702.7 |
| 135°   | 1719.7 | 1747.1 | 1762.4 | 1779.6 | 1776.2 |
| 137.5° | 1794.8 | 1815.4 | 1832.6 | 1849.7 | 1844.6 |
| 140°   | 1868.3 | 1882.1 | 1900.8 | 1916.2 | 1907.7 |
| 142.5° | 1930.0 | 1942.0 | 1964.1 | 1977.7 | 1969.2 |
| 145°   | 1995.0 | 1993.2 | 2022.2 | 2034.2 | 2025.7 |
| 147.5° | 2051.2 | 2046.2 | 2075.2 | 2083.7 | 2077.0 |
| 150°   | 2106.0 | 2094.1 | 2121.5 | 2131.6 | 2123.1 |
| 152.5° | 2152.1 | 2138.5 | 2164.1 | 2174.4 | 2162.5 |
| 155°   | 2196.6 | 2181.3 | 2201.8 | 2212.0 | 2198.4 |
| 157.5° | 2232.5 | 2218.9 | 2234.3 | 2246.3 | 2232.5 |
| 160°   | 2263.4 | 2253.0 | 2263.4 | 2273.5 | 2261.5 |
| 162.5° | 2290.6 | 2280.4 | 2288.9 | 2300.9 | 2285.5 |
| 165°   | 2314.5 | 2304.4 | 2309.4 | 2321.4 | 2309.4 |
| 167.5° | 2333.4 | 2323.0 | 2328.3 | 2340.3 | 2324.9 |
| 170°   | 2348.8 | 2338.5 | 2341.9 | 2353.9 | 2338.5 |
| 172.5° | 2359.0 | 2348.8 | 2352.3 | 2364.2 | 2348.8 |
| 175°   | 2367.5 | 2355.5 | 2359.0 | 2370.9 | 2353.9 |
| 177.5° | 2370.9 | 2359.0 | 2360.8 | 2372.8 | 2357.3 |
| 180°   | 2362.4 | 2362.4 | 2362.4 | 2362.4 | 2362.4 |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 7.28             | 8.07  | 8.31  | 9.11  | 10.49 | 6.84           | 7.63  | 7.86  | 8.66  | 10.05 |
|                 | 3H   | 8.94             | 9.65  | 9.98  | 10.69 | 12.10 | 8.45           | 9.16  | 9.49  | 10.20 | 11.61 |
|                 | 4H   | 9.53             | 10.20 | 10.58 | 11.25 | 12.66 | 9.04           | 9.71  | 10.08 | 10.75 | 12.16 |
|                 | 6H   | 9.93             | 10.55 | 10.99 | 11.60 | 13.02 | 9.43           | 10.05 | 10.49 | 11.10 | 12.52 |
|                 | 8H   | 10.04            | 10.62 | 11.10 | 11.69 | 13.11 | 9.53           | 10.12 | 10.60 | 11.19 | 12.61 |
|                 | 12H  | 10.08            | 10.64 | 11.15 | 11.70 | 13.15 | 9.57           | 10.13 | 10.64 | 11.19 | 12.64 |
| 4H              | 2H   | 7.73             | 8.41  | 8.79  | 9.45  | 10.86 | 7.38           | 8.05  | 8.43  | 9.10  | 10.51 |
|                 | 3H   | 9.60             | 10.16 | 10.66 | 11.23 | 12.66 | 9.19           | 9.75  | 10.25 | 10.83 | 12.25 |
|                 | 4H   | 10.32            | 10.83 | 11.38 | 11.89 | 13.34 | 9.89           | 10.41 | 10.96 | 11.47 | 12.92 |
|                 | 6H   | 10.83            | 11.27 | 11.91 | 12.36 | 13.80 | 10.40          | 10.84 | 11.48 | 11.93 | 13.37 |
|                 | 8H   | 10.98            | 11.40 | 12.06 | 12.48 | 13.93 | 10.55          | 10.96 | 11.62 | 12.04 | 13.49 |
|                 | 12H  | 11.06            | 11.43 | 12.15 | 12.52 | 13.98 | 10.61          | 10.98 | 11.70 | 12.07 | 13.53 |
| 8H              | 4H   | 10.51            | 10.92 | 11.59 | 12.00 | 13.46 | 10.13          | 10.54 | 11.21 | 11.62 | 13.08 |
|                 | 6H   | 11.14            | 11.48 | 12.24 | 12.60 | 14.06 | 10.76          | 11.10 | 11.86 | 12.22 | 13.68 |
|                 | 8H   | 11.37            | 11.67 | 12.47 | 12.77 | 14.24 | 10.97          | 11.27 | 12.08 | 12.38 | 13.85 |
|                 | 12H  | 11.50            | 11.76 | 12.61 | 12.86 | 14.37 | 11.09          | 11.35 | 12.20 | 12.45 | 13.96 |
| 12H             | 4H   | 10.49            | 10.86 | 11.59 | 11.96 | 13.42 | 10.12          | 10.50 | 11.22 | 11.59 | 13.05 |
|                 | 6H   | 11.17            | 11.47 | 12.28 | 12.58 | 14.05 | 10.80          | 11.10 | 11.91 | 12.20 | 13.68 |
|                 | 8H   | 11.42            | 11.68 | 12.53 | 12.78 | 14.29 | 11.04          | 11.30 | 12.15 | 12.40 | 13.91 |